

Customer No.: 31561  
Application No.: 10/709,923  
Docket No.: 10788-US-PA

### **REMARKS**

#### **Present Status of the Application**

Present pending claims 6-14 are rejected. Specifically, claims 6-8, 10, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuyama et al. (U. S. Patent 6,689,639; hereinafter Sakuyama) in view of Beddingfield et al. (U. S. Patent 5,710,071; hereinafter Beddingfield '071). In addition, claim 9 is rejected under 35 U. S. C. 103(a) as being unpatentable over Sakuyama in view of Beddingfield '071 and further in view of Acocella et al. (U. S. Patent 5,591,941; hereinafter Acocella). Claim 11 is rejected under 35 U. S. C. 103(a) as being unpatentable over Sakuyama in view of Beddingfield '071 and further in view of Gansauge et al. (U. S. Patent 5,244,833; hereinafter Gansauge). Claim 12 is rejected under 35 U. S. C. 103(a) as being unpatentable over Sakuyama in view of Beddingfield '071 and further in view of Beddingfield et al. (U. S. Patent 6,177,729; hereinafter Beddingfield '729). Applicants have amended the title. After entry of amendments, claims 6-14 remain pending in the present application, and reconsideration of those claims is respectfully requested.

#### **About the Title**

Applicants have amended the Title, directed to a process. However, Applicants respectfully decline the suggestion from the Office Action because the process of the present invention is the process to package a chip, which can include a substrate. The present invention is just not for fabricating the substrate of a chip package

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**Discussion of Claim Rejections under 35 USC 103**

1. Claims 6-8, 10, 13, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sakuyama in view of Beddingfield '071. Claim 9 is rejected under 35 U. S. C. 103(a) as being unpatentable over Sakuyama in view of Beddingfield and Acocella. Claim 11 is rejected under 35 U. S. C. 103(a) as being unpatentable over Sakuyama in view of Beddingfield '071 and Gansauge. Claim 12 is rejected under 35 U. S. C. 103(a) as being unpatentable over Sakuyama in view of Beddingfield '071 and Beddingfield '729). Applicants respectfully traverse the rejections for at least the reasons set forth below.

2. In the present invention, for example shown in FIG. 5, *the bump 226 are formed on the contact 210 of the substrate 200 but not over the bonding pad 222 and the metal layer 224 of the chip 220*. Independent claim 6 has clearly recited that the bumps are formed on the substrate at the contact. The bonding pads of the chip are then connected to the bumps by flip-chip manner. This arrangement can at least reduce the production cost... [0029], [0030].

3. In re Sakuyama, as shown in Fig. 3C and Fig. 5, clearly the bump 41 is formed on the chip X, and then the chip X is connected to the wiring board 70 (col. 10, lines 27-29). Therefore, Sakuyama failed to disclose the emphasized feature recited in claim 6.

Further, the electrode 11 is a part of the semiconductor device X (chip) for forming the bumps thereon. The electrode 71 is formed on the wiring board only at one surface.

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4. In re Beddingfield '071, the Office Action further cites Beddingfield '071 in combination with Sakuyama to provide the second contacts of the present invention. However, in Fig. 5 of Beddingfield '071, the die 20 includes the bumps 22 (col. 4, lines 14-16; Fig. 3). Therefore, Beddingfield '071 still at least failed to supply the missing features as discussed above about the bumps formed on the chip.

5. With respect to claims 6-8, 10, 13, and 14, Sakuyama and Beddingfield '071 either alone or in combination failed to disclose the features as recited in independent claim 6. With at least the same foregoing reasons, Sakuyama with Beddingfield '071 failed to disclose the features recited in dependent claims 7-8, 10, 13, and 14.

6. With respect to claim 9, the Office Action further cites Acocella in combination with Sakuyama and Beddingfield '071 for rejections. Applicants respectfully disagree.

In re Acocella, the Office Action cites Acocella about implanting tin globes and treating surface of the first contact with a flux before implanting the tin globes. However, Acocella (Fig. 4; col. 5, line 62 - col. 6, line 1) disclose the substrate 11 of the circuit board. However, the bumps 18 are formed on the substrate 10 of chip. Therefore, Acocella does not provide the missing features of Sakuyama with Beddingfield '071 in the parent independent claim 6. Claim 9 is therefore allowable for at least the same reasons.

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7. With respect to claim 11, the Office Action further cites Gansauge in combination with Sakuyama and Beddingfield '071 for rejections. Applicants respectfully disagree.

In re Gansauge, again in Fig. 6, the bumps 34 and 36 are formed on the silicon substrate 10 (col. 65, lines 7-8). The chip connection terminals 28 are formed above the contact pads 14. Likewise, Gansauge does not provide the missing features of Sakuyama with Beddingfield '071 in the parent independent claim 6. Dependent claim 11 is therefore allowable for at least the same reasons.

8. With respect to claim 12, the Office Action further cites Beddingfield '729 in combination with Sakuyama and Beddingfield '071 for rejections. Applicants respectfully disagree.

In re Beddingfield '729, the rolling ball connector is disclosed. However, Beddingfield '729 does not disclose that the bumps are formed on the substrate as recited in independent claim 6. Indeed, Beddingfield '729 discloses the die 20 with the bumps 22 (col. 4, lines 14-16; Fig. 3). Likewise, Beddingfield '729 does not provide the missing features of Sakuyama with Beddingfield '071 in the parent independent claim 6. Dependent claim 12 is therefore allowable for at least the same reasons.

For at least the foregoing reasons, Applicants respectfully submit that independent claim 6 patentably defines over the prior art references, and should be allowed. For at least the same reasons, dependent claims 7-14 patentably define over the prior art references as well.

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### CONCLUSION

For at least the foregoing reasons, it is believed that all the pending claims 6-14 of the invention patently define over the prior art and are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

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Respectfully submitted,

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